



# Learning the Earth with Artificial Intelligence & Physics (LEAP) Bylaws

## Roles and Responsibilities of the Directors

### Center Director

The Director is responsible for the strategic planning and successful execution of all components of the LEAP Strategic Plan. As the PI, the Director is responsible for developing relationships and for communicating with NSF staff. In consultation with the executive committee, the director oversees long-range research planning. The Director supervises corporate relationships, in coordination with the Corporate Engagement Director. The Director acts as the supervisor for the Managing Director. The Director also serves as joint Deputy Equity Officer. The Director ensures integration and synergy of Knowledge Transfer with the Education and Research components of LEAP, having a seat in both subcommittees. The Director is the liaison with the External Advisory Board. Final decision-making authority, reporting, and legal responsibility, including for the budget, rest with the Director. The Director works with the Institutional Integration Director to liaise with leadership at the National Center for Atmospheric Research. The Director is also responsible for NSF Site Visits, Annual Progress Reports and Renewal. The Director oversees the Center expansion, scope adjustment, and funds' reallocation in partnership and consultation with the Deputy Director and the Executive Committee.

### Deputy Center Director

The Deputy Director works closely with the Director and Managing Director on center management and governance. The Deputy Director serves as the Chief Convergence Officer of the center and leads the execution of components of the LEAP Strategic Plan related to interdisciplinary convergence and research-education integration by chairing the Convergence and Data and Computation Subcommittees. The Deputy Director is the liaison with the Director's Council. The Deputy Director supports the Director in long-range research planning. The Deputy Director works closely with the Center's evaluator and ensures all evaluation activities. In consultation with the Director and the executive committee, the Deputy Director plans and organizes research seminars, professional development activities, the Annual Meeting, and Convergence Luncheons.

### Managing Director

The Managing Director is responsible for the operation and management of the Center and supports the Center Director, Deputy Director, and the Executive Committee. They delegate to, supervise, and manage other staff (Associate Director of Programs, Manager of Communications and Knowledge Transfer, and Manager of Finance and Operations), and LEAP's physical office space at the Columbia Innovation Hub. They lead and manage daily Center operations, communications, events, and Site Visits. They are responsible for administrative coordination with all Columbia units and with partner institutions. They supervise the budget with the Director and Director of Finance. They administer the annual internal Call for Proposal funding (RFP process), facilitate recruitment of scientists, and the integration of partners' institutions, and corporate partners. They oversee outreach and communication,



partnership development, LEAP Pangeo administration, and represent the Center at meetings, conferences, symposia, and other events. The Managing Director works with staff to plan research seminars, the Annual Meeting, and Convergence Luncheons, as well as plan professional development events and support the junior scientist advisory group.

#### Education Director

The Education Director works closely with the Deputy Director and oversees the execution of all educational programs. Working with the Deputy Director, the Education Director ensures the execution of all evaluation activities related education programs. Following guidance and decisions of the Executive Committee, the Education Director leads the implementation of strategies to ensure the needs of non-Columbia institutional partners are met by the center's education offerings. They ensure the equitable and training of climate data scientists by working closely with the Chief Equity Officer & Knowledge Transfer Director. They supervise and review the Associate Director of Programs with the Director and Managing Director.

#### Chief Equity Officer & Knowledge Transfer Director

The Chief Equity Officer & Knowledge Transfer Director ensures that diversity, equity and inclusion are taken into account in all LEAP activities. They oversee DEI assessment with respect to recruiting activities, as well as LEAP staff training. The Chief Equity Officer & Knowledge Transfer Director supervises the equitable and training of climate data scientists led by the Education Director. The Chief Equity Officer & Knowledge Transfer Director supervises the bidirectional knowledge transfer with public and private partners. They supervise and review the Senior Manager of Communication & Knowledge Transfer with the Managing Director and Director.

#### Institutional Integration Director

The Institutional Integration Director is responsible for representing the needs of non-Columbia institutional partners to the Executive Committee and ensuring their fair representation in the center decision making process, as well as in the funding mechanism. The Institutional Integration Director supervises the Integration Engineer and liaises with leadership at the National Center for Atmospheric Research.

#### Model Development Liaison

The Model Development Director is responsible for coordinating the integration of LEAP algorithms into CESM and supporting their portability to other models, including NASA ModelE. They supervise the integration engineer at NCAR.

#### Geoscience Director

The Geoscience Director is responsible for representing the needs of geoscience research ongoing in LEAP and advocating for new research directions that can support LEAP objectives, and to present these to the EC and Convergence Working Group.

#### Data Science Director

The Data Science Director is responsible for representing the needs of data science research ongoing in LEAP and advocating for new research directions that can support LEAP objectives, and to present these to the EC and Convergence Working Group.



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### Corporate Engagement Director

The Corporate Engagement Director is responsible for engaging corporate partners to understand their needs in the climate data science spectrum, from more research oriented to more knowledge transfer oriented, defining and reevaluating key partners across the years, and working with LEAP to meet these needs. The Corporate Engagement Director coordinates engagement with the Center Director and spearheads the vetting process for corporate engagement.

## **Changing of Directors**

Center Director Succession - If the Center Director steps down, the Deputy Director assumes interim, and in the meantime, the EC will conduct a search. At the end of the six months, the EC will vote to determine the permanent Center Director.

Other Directors - If a Director other than the Center Director leaves their role, the EC will be responsible for identifying a replacement, and providing the results of their vote to the Center Director. The Center Director will make the final decision on the appointment.

## **Committee Membership and Responsibilities**

In the event a Committee or Subcommittee member with voting privileges ceases their membership, it is the responsibility of that Committee or Subcommittee to determine whether the stated responsibilities and decision-making authority of that body can still be achieved, and, if not, to discuss and determine a suitable replacement via consensus. Appendix A contains a record of Committee and Subcommittee changes.

### Executive Committee (EC)

The EC will have 9 members: Director (Chair), Deputy Director, Education Director, Chief Equity Officer & Knowledge Transfer Director, Institutional Integration Director, Model Development Liaison, Geoscience Director, Data Science Director, Corporate Engagement Director, and Managing Director. All 9 members have voting privileges. The EC is staffed by the Managing Director.

The EC is LEAP's principal forum for strategic and operational decision-making.

EC responsibilities and decision-making authority are to

- Continually review research, education, DEI, KT and LEAP Pangeo progress toward strategic goals
- Develop and annually review the LEAP Strategic Plan
- Review internal funding recommendations from Convergence Working Group for DEI and institutional balance
- Plan Annual Meeting and workshops
- Steward existing and forge new institutional partnerships
- Liaise with Junior Scientists Advisory Group

A voting quorum will be seven and majority votes with a quorum will be decisive.



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### Convergence Working Group (CWG)

The CWG will include six members: Deputy Director (Chair), Education Director, Institutional Integration Director, Data and Computing Manager, Representative from JSAG, Center Evaluator, Model Development Liaison, Geoscience Director, and Data Science Director. The Director is an ex-officio member with voting privileges. The CWG is staffed by the Managing Director.

The CWG is LEAP's principal forum for coordination of research and education activities.

CWG responsibilities and decision-making authority are to

- Assess research progress against strategic indicators
- Identify priority research directions
- Oversee internal proposals for research ("internal RFP")
  - Define research priorities
  - Establish process to review proposals
  - Conduct review of research projects every six months, provide feedback as needed

The EC in turn will:

- Consider budget, given data from the Management Committee
- Vote on funding recommendations
- Present funding recommendations to EC for final approval
- Recommend 1 year projects for renewal
- Ensure convergence of data science and climate science
- Ensure convergence of research and education
- Assess research education against strategic indicators
- Select LEAP Momentum Fellows

A voting quorum will be five and majority votes with a quorum will be decisive. Members must be present to vote.

### Knowledge Transfer Subcommittee (KTSC)

The KTSC includes five members from the LEAP EC: Chief Equity Officer & Knowledge Transfer Director (Chair), Center Director and Deputy Equity Officer, Corporate Engagement Director, Managing Director, and Public Engagement Director. LEAP's Education Evaluator and a representative of Teacher's College, one of LEAP's subawardees, are members without voting privileges. The KTSC is staffed by the Manager of Communications and Knowledge Transfer.

The KTSC is the principal forum for implementing diversity, equity and inclusion and knowledge transfer activities of LEAP.

KTSC responsibilities and decision-making authority are to

- Establish metrics for diversity, equity and inclusion
- Establish metrics for knowledge transfer
- Review progress against DEI and KT metrics
- Plan DEI Workshops, Hackathon
- Manage corporate and public engagement
- Report to the EC monthly
- Planning monthly Convergence Luncheons



A voting quorum will be three and majority votes with a quorum will be decisive. Members must be present to vote.

### Management Subcommittee (MSC)

The MSC includes three members from the LEAP EC: the Center Director, Deputy Director, and Managing Director, supported by the Finance Manager. The MSC is responsible for the day-to-day management and operations of the center.

#### MSC responsibilities and decision-making authority

- Review the annual budget (past year and projected) and approval weekly expenditures, based on an overview and analysis by Center Director and Finance Manager during weekly meetings with Finance Manager
- Implementation of center business
- Resolve internal conflicts in consultation with Chief Diversity Officer
- Hire and review staff. Review will be done in partnership with the Chief Convergence Officer & Education Director, who oversees the Associate Director of Programs and the Chief Equity Officer & Knowledge Transfer Director who oversees the Senior Manager for Communication & Knowledge Transfer

### Data and Computation Working Group (DCWG)

The DCWG includes 8 members: Chair (TBD), Center Director and Deputy Equity Officer, Chief Convergence Officer & Education Director, Chief Equity Officer & Knowledge Transfer Director, Manager of Data and Computation, Integration Engineer, one Senior Scientist engaged supported by an RFP project, the Data and Computation Advisor and the Managing Director. The DCWG is responsible for overseeing status and strategic directions for the data and computing strategy of LEAP, especially LEAP-Pangeo. The DCWG is staffed by Wayne Chuang..

#### DCWG responsibilities

- Review LEAP-Pangeo progress and plans at least twice per year
- Ensure LEAP-Pangeo is meeting research, education and knowledge transfer needs
- Forecast and define data and compute needs; determine if more resources need to be sought
- Report on LEAP-Pangeo to the EC
- Discuss progress and opportunities to integrate LEAP research into CESM



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## External Committees

### External Advisory Board

#### Membership:

1. Prof. Melissa Burt - Colorado State University
2. Prof. Amy McGovern - Oklahoma University
3. Prof. Sonia Seneviratne - ETH Zurich
4. Prof. Rafael Bras - Georgia Tech
5. Prof. Bin Yu - UC Berkeley
6. Prof. Montserrat Fuentes - St Edward's University
7. Prof. Rebecca Nugent - Carnegie Mellon University

Staffed by: Managing Director

#### Responsibilities:

- Advising on strategic partnership formation
- Advising on the external competitive environment
- Advising on complementary NSF grants to bolster its broader

Meeting Frequency: Annually

Meeting Duration: Two to three hours

## Director's Council

#### Membership:

1. Dean Shih-Fu Chang, Columbia Engineering
2. Vice Dean Garud Iyengar, Columbia Engineering
3. Interim Dean Jeffrey Shaman, Climate School
4. Interim Director Steven Goldstein, Lamont-Doherty Earth Observatory
5. Dean Costis Maglaras, Columbia Business School
6. Dean Melissa Begg, Columbia School of Social Work
7. Dean Amy Hungerford, Executive Vice President for Arts and Sciences and Dean of the Faculty of Arts and Sciences, Columbia
8. Dean James Bullock, School of Physical Sciences, UC Irvine
9. Dean Russel Caflisch, Director, Courant Institute of Mathematical Sciences, NYU
10. Jon Petch, Climate and Global Dynamics Director, NCAR

Center Director and Center Deputy Director are ex-officio members.

Staffed by: Managing Director

#### Responsibilities:

- Reviewing preliminary draft of Annual Progress Reports and providing feedback for improvement
- Providing administrative guidance
- Supporting continuous and streamlined inter-institutional integration

Meeting Frequency: Annually

Meeting Duration: One hour



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## Staff Roles and Responsibilities, Reporting

Staff ensures that research, educational, broadening participation, and knowledge transfer initiatives have proper operational support. All staff members are currently supporting/assisting the Center's activities and efforts. Staff members will be included in relevant parts of the decision-making process.

### *Managing Director*

- Reports to: Center Director
- Role and Responsibilities: The Managing Director supports the Center Director, Deputy Director, and the Executive Committee. They delegate to, supervise, and manage other staff (Associate Director of Programs, Senior Manager of Communications and Knowledge Transfer, and Manager of Finance and Operations), and LEAP's physical office space at the Columbia Innovation Hub. They lead and manage daily Center operations, communications, events, and Site Visits. They are responsible for administrative coordination with all Columbia units and with partner institutions. They supervise the budget. They administer the annual internal Call for Proposal funding (RFP process), facilitate recruitment of scientists, and the integration of partners' institutions, and corporate partners. They oversee outreach and communication, partnership development, and represent the Center at meetings, conferences, symposia, and other events.

### *Integration Engineer*

- Reports to: Integration Director
- Role and Responsibilities: The Integration Engineer supports the development and integration of machine learning algorithms and their implementation in the Community Earth System Model (CESM). They provide software engineering support to aid implementation of new science, maintenance of testing frameworks, and development of new infrastructure in the CESM. They are in residence at NCAR.

### *Senior Manager of Communications and Knowledge Transfer*

- Reports to: Managing Director
- Role and Responsibilities: The Manager of Communications and Knowledge Transfer supports knowledge transfer programming linking academia with external stakeholders. They also manage the Center's website and social media platforms, author publications and opinion pieces, author content targeting corporate, non-profit, and public audiences, author a monthly newsletter, publish articles across owned and earned media outlets, supervise communications vendors, and stewards and establishes external partnerships with industry, state, local governments, and NGOs.

### *Associate Director of Programs*

- Reports to: Managing Director
- Role and Responsibilities: The Associate Director of Programs supports LEAP's educational programs for faculty, graduate, undergraduate, K-12, teacher, and parent trainees. They also facilitate rotation of LEAP Fellows to NCAR. They provide administrative support to the Convergence Working Group and the Data and Computation Working Group.





#### *Manager of Finance and Operations*

- Reports to: Managing Director
- Role and Responsibilities: The Manager of Finance and Operations serves as LEAP's financial, accounting, procurement, subaward, and HR specialist and manages daily financial operations. They are also responsible for trainee hiring and payroll.

#### *Manager of Data and Computation*

- Reports to: Director
- Role and Responsibilities: Coordinate implementation, education, and dissemination of the data infrastructure. Work with the LEAP community to ensure computing needs are met.

### **Other Roles**

#### *Advisor*

- As deemed necessary by the EC, advisors may be appointed to support LEAP strategic priorities.
- Role and Responsibilities: A statement of work will be drafted and approved by the EC; these will be linked in Appendix A.





### Appendix A

Date	Committee or Subcommittee Name	Change	Outcome
October 2022	Convergence Working Group	Ryan Abernathy, Data and Computation Director, is no longer a participating member as of October 2022.	The Convergence Working Group voted on November 10, 2022 that the stated responsibilities, work, and decision-making authority of the subcommittee can be achieved without filling Ryan Abernathy’s position.
October 2023	Executive Committee	Data and Computation Director; Public Engagement Director have left the project.	<i>The EC will vote on whether these roles should be replaced.</i>
January 2024	Executive Committee	Galen McKinley, former Deputy Director is no longer an active member of the Executive Committee	